

REMARKS

Filed as separate documents herewith are replacement sheets of drawings for FIGS. 1-23 (labeled "Replacement Sheet") and a substitute specification. A clean version of the specification and a marked version to show the changes made are being submitted. Among other things, certain reference numbers have been changed and minor corrections have been made to improve the clarity of the disclosure. In addition, the working nozzle outer surface 35 and inner surface 33 have been given reference numbers to better explain and avoid any possible confusion concerning, for instance, amended claim 42. Applicants submit that no new matter is being introduced as a result of these amendments. Applicants further submit that the working nozzle outer surface and inner surface, meeting the limitations of amended claim 42, were clearly illustrated in the original drawings.

Claims 61-123 have been canceled herein without prejudice and claims 1-5, 8, 10, 14, 20, 35, 39, 42, and 43 have been amended herein without prejudice. Claim 40 was previously canceled. No new claims have been added. Claims 7, 13, 16-18, 23-27, 29-34, 45, 48, and 53-55 have been withdrawn. Claims 6, 9, 11, 12, 15, 19, 21, 22, 28, 36-38, 41, 44, 46, 47, 49-52, and 56-60 remain in their original form. A total of 37 claims remain pending and not withdrawn in this patent application, which include two independent claims, namely, claims 1 and 39. Applicants submit that no new matter has been introduced through the amendments herein, and that the current claims are fully supported by the original disclosure. For example, the "means for creating a dispersed droplet flow regime..." of claim 1 and the "annular" transport and working nozzles of claim 39 are shown in the drawings and also find additional support in the specification and original claims.

The Patent Office refused to enter the claim amendments made by Applicants on 4/27/09, made its own unilateral election of species for examination, and examined claims that Applicants had instructed the Patent Office to be canceled (without prejudice) in favor of the new claims. The Patent Office rejected the election made by Applicants on 4/27/09 alleging that the election was improper because new claims that

Applicants had added were (allegedly) directed to an invention that is independent or distinct over the previous claims. Applicants disagree with the actions of the Patent Office. Namely, Applicants submit that examination on the merits had not begun at the time the election was made and the amendment was filed, since the claims had not been examined at that time. Consequently, Applicants were free to cancel the claims and replace them with new claims at that time. Further, Applicants maintain their remarks made in the 4/27/09 amendment. In an effort to advance prosecution of the patent application, however, rather than arguing over procedural matters, Applicants will proceed with the claims that were examined by the Patent Office, but Applicants reserve their rights to pursue the claims from the 4/27/09 amendment in a continuing patent application. Thus, Applicants herein cancel (without prejudice) the claims 61-123 that Applicants entered by amendment on 4/27/09, and withdraw the other claims that were not examined. Applicants have amended both independent claims that were examined and many of the dependent claims to put the claims in better form for allowance. Applicants submit that the claims are now suitable for allowance over the prior art of record, and reconsideration is requested.

The Patent Office issued a provisional non-statutory double patenting rejection citing certain claims of copending patent application 10/590,456. A patent has not yet issued for that patent application. Consequently, Applicants submit that the issue of whether a terminal disclaimer is appropriate is not yet ripe for determination. Applicants request that this issue be tabled until a patent issues from the 10/590,456 patent application.

The Patent Office rejected claim 1 under 35 U.S.C. 112, second paragraph, as being indefinite because it contained the phrase "adapted to". Without consenting to this rejection, but responsive thereto, Applicants have amended claim 1 to remove the word "adapted", in two locations, thus overcoming this rejection. This was the only rejection made under 35 U.S.C. 112 for indefiniteness. Now that this claim amendment has been made, reconsideration of this rejection is requested. In addition, although not rejected to by the Patent Office, Applicants also removed the word "adapted" from claim 20.

The Patent Office rejected claims 1-6, 8-12, 14, 15, 19-21, 28, 35-39, 41-44, 46, 47, 49-52, and 56-60 under 35 U.S.C. 103(a) as being unpatentable over US patent publication 2003/0150624 (Rummel) in view of US patent 5,810,252 (Pennamen). For claims 46 and 47, the Patent Office also cited US patent 6,003,789 (Base). Without consenting to these rejections, Applicants have amended (without prejudice) claims 1-5, 8, 10, 14, 20, 35, 39, 42, and 43. In addition, Applicants disagree with many of the points made by the Patent Office in the rejections. Furthermore, Applicants submit that, at least as amended, the current claims are patentable over the cited documents because these documents do not teach or suggest all of the limitations of any of the pending claims and because there would have been no motivation to combine the cited documents or to have modified them to arrive at the claimed invention.

Rummel concerns a nozzle (title) used for making foamed concrete, plastic, cement, plaster, chalk, or the like (paragraphs 0002, 0048, 0050, and 0084). Spraying, misting, and atomizing are mentioned (e.g., title, 0001), but no practical way to do so is described. Component 7 and chamber 9 are described as being annular, but ducts 5 that deliver air to the concrete, or to other viscous substance being foamed, are radially arranged individual bores that are each round, and are not themselves annular (0075, 0076, 0079). Fire extinguishing is mentioned only in so far as to say that fire extinguishers will only work if the liquid medium and propellant are both contained in the container of the fire extinguisher (0004). This teaching is in contrast with the invention described in Rummel, as well as being in conflict with the present invention, where continuous processes are used rather than expelling materials stored in a pressure vessel.

Pennamen concerns atomizing petroleum distillate residue for purposes of combustion (abstract, col. 1, lines 12-15). Droplet sizes are identified as being on the order of 100 micrometers, less than 290 micrometers, less than 120 micrometers, and about 35 micrometers (abstract, col. 5 lines 28 and 67, col. 6 lines 27-32). Base concerns a nozzle or mixing means for mixing oil and steam that produces droplets as small as 300 micrometers (title, abstract). Supersonic flow is mentioned (abstract).

Applicants submit that the cited documents do not render obvious the current claims because, even if combined, the cited documents do not teach or suggest the currently pending claims, as amended. In addition, applicants submit that absent hindsight, a person of ordinary skill in the art would have had no motivation to combine any of the cited documents or to modify them to arrive at the present invention.

The Patent Office states that Pennamen teaches that a substantial portion of the droplets have a size less than 10 micrometers (pages 6 and 10 of the office action, citing the abstract of Pennamen). The abstract of Pennamen, however, states that the droplet size produced is "on the order of 100 thousandths of a millimeter". A "thousandth of a millimeter" is a micrometer, so 100 thousandths of a millimeter is 100 micrometers. Further, 100 micrometers is more than 10 micrometers, and is even more than 20 micrometers, as recited in independent claims 1 and 39. Consequently, the abstract of Pennamen does not teach or suggest, at least:

a means for creating a dispersed droplet flow regime in which a substantial portion of the droplets have a size of less than 20 micrometers
as recited in claim 1, or an act of:

creating a dispersed droplet flow regime of droplets under the shearing action of the working fluid on the transport fluid in which a substantial portion of the droplets have a size less than 20 micrometers

as recited in independent claim 39. As stated above, Pennamen mentions droplets as small as 35 microns (micrometers) (col. 5, line 67, col. 6, line 27), but 35 is still more than 20. Although not cited for this claim limitation, Base mentions droplet sizes of 12,000 and 300 micrometers, which are both substantially more than the 20 micrometers of the current claims. As a result, even if combined, the cited documents do not teach or suggest these claim recitations. Further, particularly concerning claim 1, the cited documents, even if combined, do not teach or suggest the corresponding structure described in the Applicants' disclosure, or equivalents thereof.

For at least these reasons, Applicants submit that the current independent claims are allowable over the documents cited by the Examiner. Further, Applicants

submit that the dependent claims are allowable because they are dependent upon an allowable base claim. In addition, many of the dependent claims are allowable because they contain other subject matter not taught or suggested by the cited documents.

Concerning claim 3, for example, the Patent Office stated that it would have been obvious to have the distribution of droplet size be greater than 90% because discovering an optimum value involved only routine skill in the art (Office Action page 7). Applicants submit, however, that the invention goes beyond the discovery of the optimum droplet size distribution, and that the current claims include particular novel structure to produce the specific droplet sizes.

Concerning claim 11, the Patent Office stated that Rummel taught the inner and outer surfaces of the transport nozzle both being substantially frustoconical in shape. (Office Action page 8). Applicants submit, however, that component 7 and chamber 9 are described in Rummel as being annular, but ducts 5 that deliver air to the concrete, or other viscous substance being foamed, are radially arranged round bores, and are not themselves annular (0075, 0076, 0079). Consequently, the inner and outer surfaces of the bores 5 are not substantially frustoconical in shape. Thus, this recitation of claim 11 is not taught or suggested by Rummel. And none of the other documents asserted by the Examiner remedy this gap.

Concerning claim 20, the Patent Office states that Rummel teaches a contoured portion, citing reference number 37. But “openings” 37 in Rummel are downstream of the passage 5, according to main flow direction 26 (e.g., in FIG. 5). In addition, none of the cited documents teach or suggest the corresponding structure (e.g., contouring) described in the current specification (e.g., shown in FIGS. 2 to 7).

In addition, Applicants submit that the Patent Office has not established a *prima facie* case of obviousness, because it has not identified a motivation to combine the asserted documents or to have modified them to arrive at the particular invention that is currently claimed. Applicants submit that no such motivation, absent impermissible hindsight from Applicants’ disclosure, would have existed at the time of the invention. Moreover, Applicants submit that the cited documents teach away from the present

invention. For example, Rummel teaches that fire extinguishers are only possible if the container (i.e., a pressure vessel used as a source of the fire retardant) is filled with the liquid medium and the propellant (0004). This teaches away from the present claims, wherein the working fluid and the transport gas are separate until mixed at the mixing chamber, and are not stored together in a common chamber. In addition, Rummel teaches how to foam concrete, not how to make a mist, for example, for fire suppression. A person of skill in the art concerned with creating a better system to generate a mist (e.g., for fire suppression), who happened to read Rummel, would have had no motivation from Rummel to use any of its teachings, or to try to combine it with another document to come up with the present invention.

Applicants submit that all of the rejections have been overcome and that the current claims meet the statutory requirements and are allowable over the cited documents. Reconsideration and allowance of all pending claims is requested. Should Examiner Cernoch believe that a discussion would help to advance allowance of this patent application, Examiner Cernoch is invited to telephone the undersigned.

Respectfully submitted,

Date: 2/16/10

By



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